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REMARKS

Claims 51-94 are pending in the application, with claims 51-70, 73, 74, 80-82, 84-86, 88, 89, 92, and 93 having been rejected, and claims 71, 72, 75-79, 83, 87, 90, 91, and 94 having been objected to. The rejections are traversed. Further examination and reconsideration respectfully are requested.

*Status of Examiner's Consideration of Applicants'
Information Disclosure Statements*

The examiner's acknowledgement of the Information Disclosure Statements filed on April 14, 2004 and on March 22, 2004 is noted with appreciation.

Explanation of the Amendment

Claim 88 has been amended to correct two minor antecedent basis problems. In one instance, the claim recites "the at least a first front surface" but "first front surface" has no antecedent basis. The claim has been amended to recite "the at least a first front reflecting surface" which has clear antecedent basis in the limitation "the front side including ... at least a first front reflecting surface." In the other instance, the claim recites "light detecting means for detecting light transmitted out of the exit surface" but the antecedent basis for "light" could be more clear. The claim has been amended to recite "light detecting means for detecting the dispersed divergent light transmitted out of the exit surface," which has clear antecedent basis in the limitation "the first diffracting means being arranged to disperse diverging light received from the at least one input means." Since the amendment only makes explicit what is inherent, the scope of claim 88 is not narrowed in any respect by this amendment.

Independent Claim 88 is Not Anticipated by Yoshida

The examiner rejected independent claim 88 under 35 U.S.C. § 102(b) as being anticipated by Drawing 3 of Japanese Patent Publication No. 05-203824 ("Yoshida"). The rejection is traversed.

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Drawing 3 of Yoshida discloses an optical pickup used for optical data storage. Narrow bandwidth light from a semiconductor laser diode 101 passes through a diffraction grating 102 to enter a transparent substrate 100, reflects three times from the surface of the transparent substrate 100 by "total" reflectors 103, 104 and 105, is collimated and redirected by diffraction grating (or holographic lens) 106, and is focused by actuated objective lens 107 onto the recording surface of an optical disc 111. Light reflected from the disc 111 returns in reverse along the same path all the way to diffraction grating 102, where it is then reflected by the diffraction grating 102, focused by concave lens 108 and cylindrical lens 109, and detected by photo detector 110 to read the information recorded on the disk.

To anticipate a claim, the reference must teach every element of the claim. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. Applicants respectfully submit that Yoshida does not disclose every element of the rejected claim.

Claim 88 recites an apparatus for measuring spectral information of light from at least one object. To this end, the claim recites a number of limitations, including the following:

- a first diffracting means for diffracting light arranged to disperse diverging light received from the at least one input means; and
- a light detecting means for detecting the dispersed divergent light transmitted out of the exit surface.

As the examiner will appreciate, the laser diode light source 101 of Yoshida furnishes coherent narrow bandwidth light, which is commonly used for reading optical disks. Accordingly, none of the components disclosed by Yoshida are selected or arranged for purposes of dispersing light or using dispersed light, which directly contrasts with what is needed to achieve a stated object of the present invention, namely measuring spectral

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Information of light as stated in the present application on page 7, lines 13-15. This is clearly so with respect to, for example, Yoshida's photo detector 110, which has no need or capability of distinguishing between various wavelengths in light since the light used in Yoshida is essentially of a single wavelength. Since Yoshida does not disclose a light detecting means for detecting dispersed divergent light, Yoshida does not contain all the elements of claim 88. Therefore, claim 88 is not anticipated by Yoshida.

*Independent Claims 51, 88 and 89 and Claims
Dependent Therefrom Are Not Obvious Over Yoshida*

Independent claims 51 and 89 stand rejected under 35 USC § 103 as being obvious over Japanese Patent Publication No. 05-203824 ("Yoshida"). The rejection of independent claims 51 and 89 and their dependent claims is traversed. Independent claims 51 and 89 and their dependent claims, as well as independent claim 88 and its dependent claims, are not obvious over Yoshida for the following reasons.

Drawing 3 of Yoshida was used as the base disclosure, with the aspheric element teaching of Drawing 2 being applied to the disclosure of Drawing 3. The disclosure of Drawing 3 is discussed above. Drawing 2 of Yoshida discloses an embodiment that is similar to the embodiment of Drawing 3, except that the laser component 31 and detector 44 are both mounted on a side 30c of the transparent substrate 30, aspheric surface objective lens 35 is incorporated into the substrate 30, and the diffraction grating 32 splits the beam into three forward-traveling orders (-1, 0, +1). The three orders are believed to be used for three-beam tracking, which is well-known in the field of optical data storage.

A prima facie case of obviousness requires that three basic criteria be established. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to

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make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicants' disclosure. See MPEP § 2142, Eighth Edition, Rev. 2, May 2004, page 2100-108. Moreover, a prior art reference must be considered in its entirety, which is to say as a whole, including portions that would lead away from the claimed invention. See *Id.* § 2141.02, page 2100-125.

The combined teachings of the Yoshida reference do not teach or suggest all of the claim limitations. Claim 51 recites an apparatus for measuring spectral information of light from at least one object. To this end, the claim recites a number of limitations, including the following:

- a first diffractive optical element arranged to disperse diverging light received from the at least one entrance aperture; and
- a light detector unit arranged to receive the dispersed light through the exit surface from the at least one reflecting surface on the front side.

Claim 88 recites an apparatus for measuring spectral information of light from at least one object. To this end, the claim recites a number of limitations, including the following:

- a first diffracting means for diffracting light arranged to disperse diverging light received from the at least one input means; and
- a light detecting means for detecting the dispersed divergent light transmitted out of the exit surface.

Claim 89 recites a method of measuring spectral information of light from an object. To this end, the claim recites a number of limitations, including the following:

- diffracting the divergent signal light with the diffractive element into divergent, separated wavelength components;
- reflectively focusing the divergent, separated wavelength components to an exit face using a focusing reflector on the transparent body; and

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- detecting the focused, separated wavelength components using a detector unit.

Common to all of these claims is the concept of light dispersion, which is expressed in each of these claims in somewhat different ways. In claim 51, for example, the light detector unit is arranged to receive the dispersed light, which arises with the arrangement of the first diffractive optical element. In claim 88, for example, the light detecting means is for detecting dispersed light, which arises with the first diffracting means. Method claim 89, for example, recites diffracting the divergent signal light into divergent and separated wavelength components, reflectively focusing them to an exit face, and then using a detector unit. Since Yoshida has no teaching or suggestion regarding light dispersion, it does not teach or suggest any of the claim limitations that involve light dispersion.

That Yoshida has no teaching or suggestion regarding light dispersion is apparent from the reference itself. Note that the device disclosed by Yoshida uses a laser diode as its source. A laser diode is known to have extremely narrow spectrum. In fact, optical data storage requires a narrow spectrum for operation, and the optics used to read and write optical discs are typically designed to function only in a small bandwidth around a central wavelength. As a result, there is nothing in Yoshida to suggest dispersion (i.e., separation by wavelength) of any type, or measurement of any spectral properties whatsoever. The various elements in Yoshida are selected and arranged to function at one wavelength, which is particularly apparent with respect to, for example, the detector 101, which is incapable of discerning among multiple wavelengths.

While applicants do not acquiesce to the rejection of the dependent claims, which may recite additional limitations of independent patentable significance, extensive discussion of their independent patentability is moot in view of the remarks made in connection with the independent claims. However, as some of these dependent claims were rejected over Yoshida in combination with other references, applicants will now

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show that none of these other references contains any teachings or suggestions contrary to the points made above with respect to Yoshida.

Claims 52-54 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida in view of U.S. Patent No. 5,644,396 ("Hopkins"). Hopkins discloses a spectrograph having a collimating lens unit, a reflective diffraction grating, a focusing lens unit, and a light detector. The collimating lens unit has at least one optical element with at least one aspheric surface for collimating light from a light source. Nothing in Hopkins teaches or suggests an element that disperses diverging light.

Claims 58, 67 and 68 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida in view of U.S. Patent No. 5,812,262 ("Ridyard"). Ridyard discloses an ultra violet radiation detector having an entrance slit from which radiation diverges to a curved reflective face, which reflects it to a planar diffraction grating as a convergent beam. Nothing in Ridyard teaches or suggests an element that disperses diverging light.

Claims 59, 63 and 64 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida in view of U.S. Patent No. 6,198,864 ("Lemoff"). Lemoff discloses a demultiplexer, embodied as a unitary optically transparent structure that utilizes focusing relay mirrors to relay a multi-wavelength beam of light among a series of wavelength-specific interference filters, with each filter separating out a specific wavelength component from the multi-wavelength beam. Nothing in Lemoff teaches or suggests an element that disperses diverging light. Indeed, the only wavelength separation in Lemoff occurs at multiple wavelength-selective mirrors, not with a diffractive optical element.

Claims 65 and 66 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida in view of Lemoff, Ridyard, and U.S. Patent No. 5,504,629 ("Lim"). Lim discloses an optical projection system, having a non-point light source, an array of actuated mirrors, a projection screen, a projection lens and a lens system including a first

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lens unit, a second lens unit and an optical baffle located therebetween, wherein the optical baffle is provided with a plurality of apertures and light absorbing regions. Nothing in Lim teaches or suggests an element that disperses diverging light.

Claim 69 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida in view of Ridyard, and U.S. Patent No. 4,332,706 ("Uehara"). Uehara discloses a coating material that reduces the internal reflection of an optical glass. Nothing in Uehara teaches or suggests an element that disperses diverging light.

Claim 70 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida in view of Ridyard, Uehara and U.S. Patent No. 5,622,904 ("Ohkubo"). Ohkubo discloses a glass material for molding an optical element. Nothing in Ohkubo teaches or suggests an element that disperses diverging light.

Claims 80-82, 84-86, 92 and 93 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yoshida in view of U.S. Patent No. 4,796,246 ("Tsuyoshi") and U.S. Patent No. 6,385,160 ("Jeon"). Tsuyoshi discloses a method and apparatus for performing tracking in an optical disk system (i.e., keeping a beam focused on one particular track as the optical disk spins). Jeon discloses a tilt adjustment for the pickup in an optical disk player. Nothing in Yoshida, Tsuyoshi or Jeon teaches or suggests an element that disperses diverging light, or divergent, separated wavelength components. Yoshida, Tsuyoshi and Jeon all are directed toward optical disk systems, which all use a laser diode as the light source, and operate essentially monochromatically. There is no wavelength separation of any sort performed in an optical disk system, let alone dispersing of diverging light or separated wavelength components.

Conclusion

In view of the foregoing amendments, it is believed that the application is now in condition for allowance. Applicants respectfully request favorable reconsideration and the timely issuance of a Notice of Allowance. If a telephone conference would be helpful

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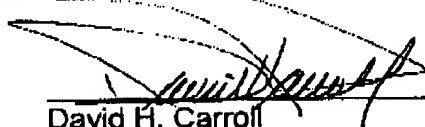
in resolving any issues concerning this communication, please contact the undersigned at (952) 253-4135.

Respectfully submitted,

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